Remark

Applicants respectfully request reconsideration of this application. No claims have been amended. No claims have been cancelled. Therefore, claims 1-21 remain present for examination.

35 U.S.C. §103 Rejection

Buehrer and Boariu

The Examiner has rejected claims 1-9 and 11-22 under 35 U.S.C. §103 (a) as being unpatentable over Buehrer, U.S. Patent Application Publication 2003/0081656 ("Buehrer"), in view of Boariu, U.S. Patent No. 6,865,237 ("Boariu").

It has been Applicant's position that the present invention is unique in that the same signal is sent to a single receiver through different propagation paths on different sub-carriers. Previous amendments have sought to make this clear in the claims.

In light of the cited references, the issue can best be divided into two parts. First, do the references redundantly transmit? Second, do the references transmit using subcarriers over two or more antennas using different complex weights to achieve a different physical path.

Redundant Transmission

In his Response to Arguments, the Examiner addresses Applicants' previous arguments. On the redundantly transmit issue, the Examiner cites to the Abstract of Buehrer and paragraph 91. The Examiner quotes that "the input sequence is split into three streams of data." It would seem that redundant can mean "excess" or "duplicate" (Webster's Unabridged ©2000). "Duplicate" is the typical meaning in communications and electronics as provided by the dictionary examples and it is the meaning intended

here. Applicant's specification refers to signals that are "partially redundant" and "sub-carriers bearing the same redundant information." This context suggests that redundant means that the signals are the same.

If Claim 1 means that the same signal is transmitted on two different sub-carriers, then Buehrer does not meet the claim. The question is whether the three streams of data $s_1(t)$, $s_2(t)$ and $s_3(t)$ are each the same data, different data, or different data with some overlap.

The three streams are described more fully in paragraph 79 et seq. Paragraph 79 states that the "the data is simply split into 3 streams." Paragraph 81 states that "no diversity is achieved at the uncoded symbol level." "The data is interleaved over all three carriers." These statements make it clear that the three streams are different. Figures 3 and 4 show even data and odd data on the different antennas. Using Walsh codes on these different streams will not make them redundant.

The language in the Buehrer abstract is ambiguous, but it is clarified in the section beginning at paragraph 79. A person of average skill in the art would understand the abstract and other generalized statements to have the meaning that they are given in the detailed description and not to apply other meanings which Buehrer did not contemplate.

The Examiner has not provided any specific analysis as to why the three streams are redundant. Accordingly, the rejection is respectfully traversed.

Different Physical Path

Buehrer clearly shows that each of the M transmit antennas each send their own signal. The different antennas provide diversity only in that their spatial locations are different. The Examiner refers to paragraph 91, but this describes the signal for only one

antenna. There is no suggestion that anything is done to get the antennas to operate together to send a single signal.

Boariu simply shows conventional transmit diversity using a single antenna for each transmission.

The Examiner would appear to be reading "complex weights" onto Walsh codes in the Response to Arguments. Beuhrer uses Walsh codes to allow the mobile to differentiate signals from different antennas (before combining them). The Walsh codes are in no way able "to ensure that each of the sub-carriers... propagates along a different physical path." (Claim 1)

The Examiner has not provided any specific analysis as to how either reference achieves "each of the sub-carriers is to be transmitted over an array of two or more antennas... by a set of complex weights... to ensure that each of the sub-carriers... propagates along a different physical path." In the references, a single antenna is used to achieve a different physical path. There are no complex weights with multiple antennas to achieve the path.

Accordingly, the rejection is respectfully traversed.

Redundantly Transmit, Different Sub-Carriers, Multiple Antennas, Different Physical Path

The present invention as presented in Claim 1 recites a combination of features that has not been seen in any reference. This combination has been found to provide significant benefits in difficult environments to reliably send data using less radio frequency resources.

The cited references not only fail to show all of these features, they fail to realize the benefits of making this combination. Accordingly, the rejection is respectfully traversed.

Conclusion

Applicants respectfully submit that the rejections have been overcome by the amendment and remark, and that the claims as amended are now in condition for allowance. Accordingly, Applicants respectfully request the rejections be withdrawn and the claims as amended be allowed.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

Request for an Extension of Time

Applicants respectfully petition for a One-Month extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a). Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.

Respectfully submitted,

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